Testimony to House Energy and Commerce Committee

Subcommittee on Energy and Power

Chairman Ed Whitfield (R-KY)

"The American Energy Initiative"

By

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Summary of Testimony of
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on behalf of the In Situ Oil Sands Alliance

The in situ sector of Canada's oil sands industry is a technologically-driven and highly innovative business. The leading in situ technology, steam-assisted gravity drainage or "SAGD", provides a commercially proven means of accessing approximately 140 billion barrels of oil – equal to the entire reserves of Iran.

SAGD uses a number of innovative technologies.

- Horizontal drilling allows access to a large resource base with minimal surface disturbance. The ratio of disturbance to developable resource is among the lowest in the oil and gas industry, globally.
- Advanced water treatment technology allows for recycling of 90% of the water used to produce steam for the SAGD process. No tailings are created and water that cannot be recycled is returned to deep, non-potable reservoirs similar to those from which it is sourced. It is essentially a closed loop.
- Natural gas fired cogeneration technology provides the steam needed for the SAGD process, while also providing electricity to the consumer grid with a carbon footprint less than half the Alberta provincial average. Continuing development of cogen in future SAGD projects will further lower the Alberta provincial grid's carbon intensity.

Technologies under development focus largely on reducing the steam to oil ratio (SOR) in SAGD operations. Reducing SOR reduces energy use (and therefore emissions intensity), water handling and recycling requirements, as well as the related costs thereby improving the economics of resource recovery. The benefits a low SOR, combined with cogeneration, yield a barrel of oil that today is 6% lower in carbon intensity that U.S. import average.

In addition, research underway is seeking to advance technology to customize oil sands export barrels. The goal is to better align those barrels with the configuration of U.S. refineries, offering significant improvements in refinery efficiency and economics and the jobs that come with them. This technology may also yield benefits in tailoring barrels to create an ideal feedstock for the creation of ultra-low sulfur diesel fuels, which provide an improved life-cycle carbon footprint.

As SAGD and related technologies are still relatively early in their development curve, there is significant potential for further improvement in carbon intensity and other environmental and economic performance metrics. Realizing these benefits may be accelerated through collaboration of government, academia and industry. In addition to research and collaboration, streamlined but still comprehensive, regulatory processes that do not unduly hinder investment and innovation will be key to reaching the full potential of SAGD oil sands development.

For the United States, continuing oil sands development offers a secure source of energy and also provides substantial benefits to the U.S. economy. These include an increase in goods and services output projected to reach $45 billion per year by 2035 and the creation of nearly half a million American jobs in that same time frame.

Written Submission

Thank you for this opportunity to discuss technology in the energy industry in Canada. This is a discussion that is both timely and of tremendous importance.

I'm Bill McCaffrey representing the In Situ Oil Sands Alliance -- a group of independent Canadian companies dedicated to responsible development of Canada's oil sands using in situ technologies.

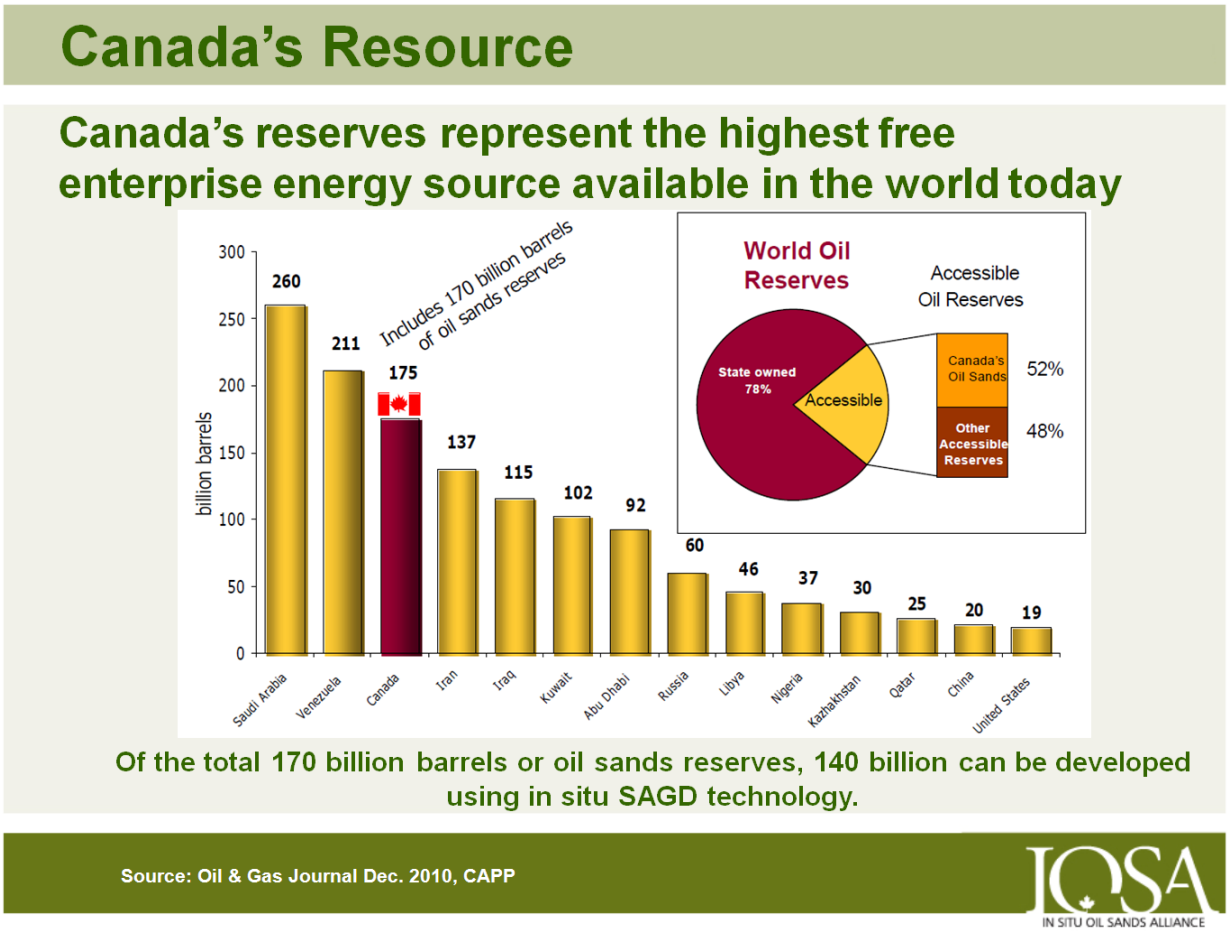
From a personal background, I wanted to mention that my career in the industry began with Amoco, who were early leaders in oil sands technology. I mention this because Amoco's historical role in Canada's energy sector – a role which I am proud to be part of -- is a great example of the kind of cross-border investment that supports our mutual energy security and job creation needs.

After leaving Amoco in 1999, I co-founded a company called MEG Energy. Today, we produce 30,000 barrels per day and have a market value of about $8 billion dollars.

The time since MEG's inception has been a story of technology and innovation in unlocking economic potential and driving environmental improvements. My submission is mainly from a perspective of my own experience in that story, and this is only as an example of developments that are occurring in

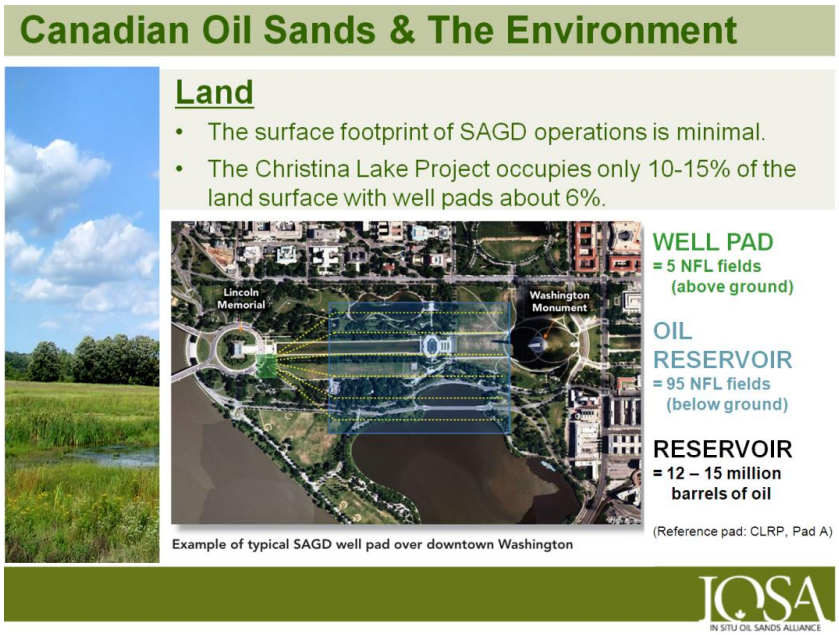
today's oils sands and the opportunities they create for the United States in the areas of energy security, employment and economic stability.

To start, I'd like to focus on a technology called steam assisted gravity drainage, or SAGD technology. SAGD is important because it is currently the only commercially proven way to reach deep oil sands reservoirs that contain 80% of the total Canadian oil sands reserves. To put that in perspective, that 80% represents about 140 billion barrels -- roughly equivalent to the entire reserves of Iran.



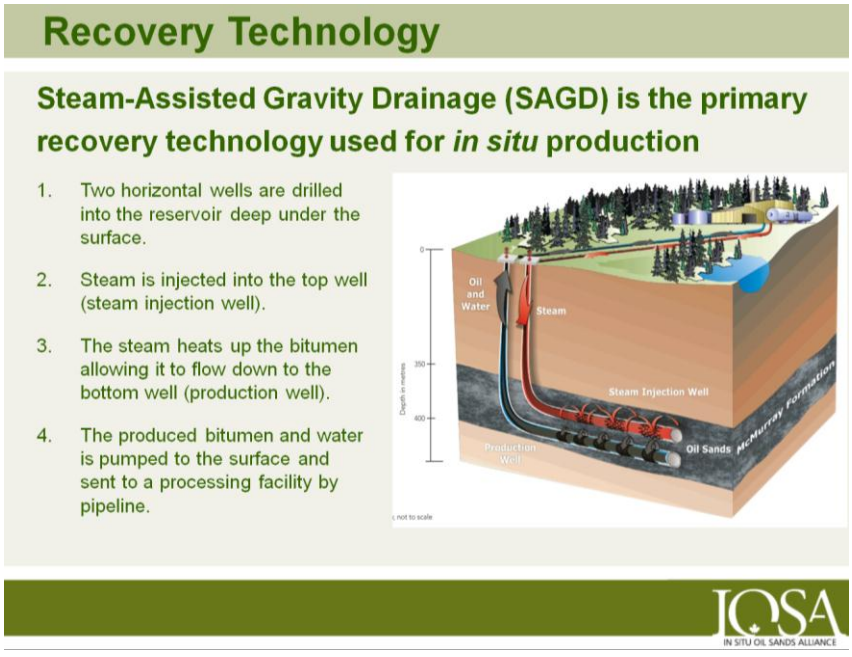
If the oil sands were to meet its economic potential in terms of production volumes, maintaining shipping through the Strait of Hormuz would not be the threat to American energy supply it represents today.

SAGD TECHNOLOGY



Without getting into too much technical detail, SAGD technology uses horizontal well pairs drilled from the surface to about 1,000 to 1,500 feet below the ground. With a pad draining an average 10 to 12 million barrels from the reservoir, this is now among the lowest ratios of surface disturbance to resource recovery in the oil and gas industry anywhere in the world.

With SAGD technology, In the subsurface wells, the top well injects steam to heat the bitumen, allowing it to drain to the lower well where it can be pumped to the surface using conventional technology, and then processed and shipped to markets.



About 90% of the water used to create steam is reused, with its residual heat captured for energy efficiency. The portion we can't recycle is returned to deep, non-potable reservoirs similar to those from which it was sourced.

There are no tailings ponds created and it is essentially a closed loop system. In fact, if you toured our facilities (and you are invited to so), you would see what looks like a water treatment plant.

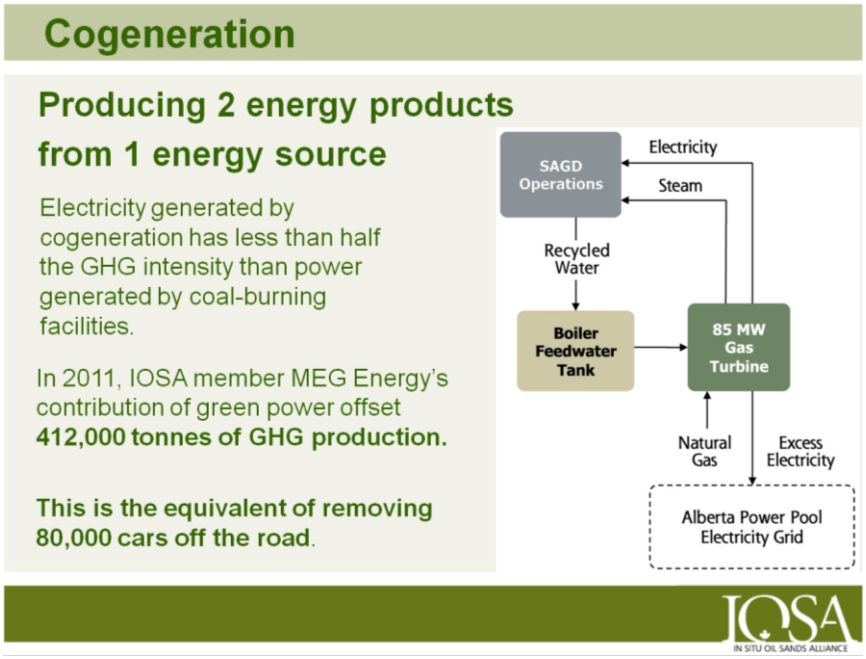
While the environmental performance of SAGD is solid, we do face some challenges. These challenges can be encapsulated in a key metric in our industry – known as the steam-oil ratio, or SOR. SOR is the amount of steam we send down the well relative to the amount of crude oil we get back.

It's an important metric because it captures three other critical measures:

- The amount of energy we use to create steam and the associated emissions.
- The amount of water we put through our systems and the required treatment for reuse.
- And -- because we are a business – the costs of energy and water management.

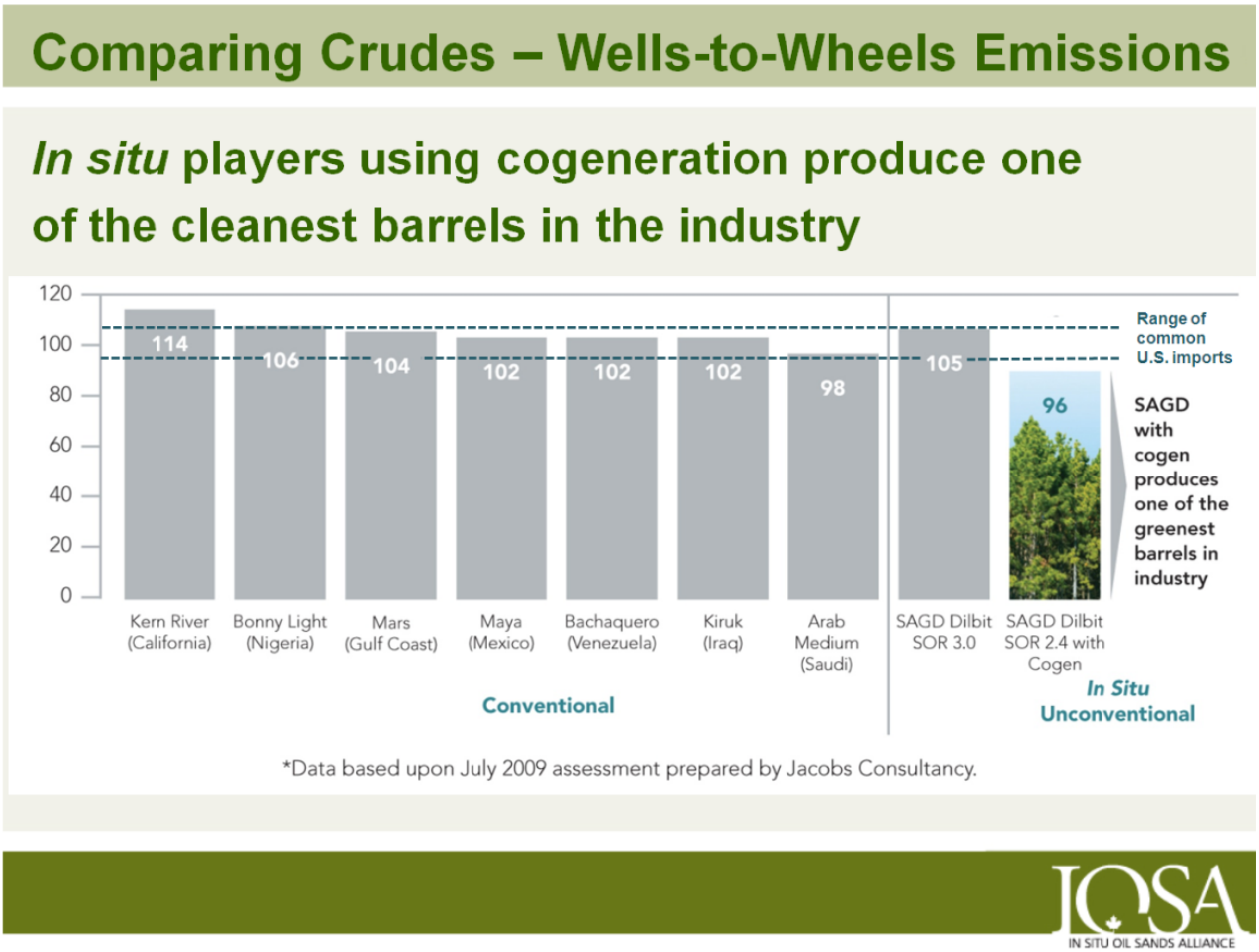
That simple view underlines why reducing SOR is a major focus of research.

One of the technologies we currently apply to the steam side of the equation is cogeneration – a very efficient process that uses clean-burning natural gas to produce both steam and electricity. The steam is used in our process, while excess electricity is sold to the grid.



That electricity has a carbon footprint less than half the Alberta grid average, helping to reduce total greenhouse gas intensity in the province. In 2011, MEG's cogeneration contribution alone was equivalent to taking 80,000 cars off the road. That kind of benefit will continue to grow as cogen replaces legacy plants that have reached the end of their useful lives.

In MEG's case, when factoring in the benefits of cogeneration and a low SOR, SAGD can produce a barrel with a "wells to wheels" carbon footprint about 15% lower than California heavy and about 6% lower than the average of U.S. imports.



As we look to the future, we are also investigating other innovative technologies. To name just three:

- Trace amounts of natural gas can be injected into mature wells to replace a portion of the steam energy component and maintain pressure in the reservoir. This substantially improves energy efficiency, lowering SORs and driving down emissions. The gas is recovered with the bitumen and cycled back into the process.

- Using "infill wells" guided by high-tech directional drilling, we can place a horizontal collector well in the sweet-spot between existing wells, increasing recovery and lowering our SORs.

- Solvent injection technology is yet another way to improve energy efficiency. That technology is well represented on the panel today.

There are many other examples. To cover them all would require a very large submission, but I would underline this point: SAGD is a proven, but still young technology -- only about 10 years old on a commercial basis. There remains tremendous opportunity for innovation and improvement to further accelerate the strides we've already made.

Looking at technology opportunities beyond our plant site, we are collaborating with Canadian and U.S. research groups to advance technology to customize our export barrels. The goal is to better align those barrels with the configuration of U.S. refineries, offering potentially significant improvements in refinery efficiency and economics and the jobs that come with them.

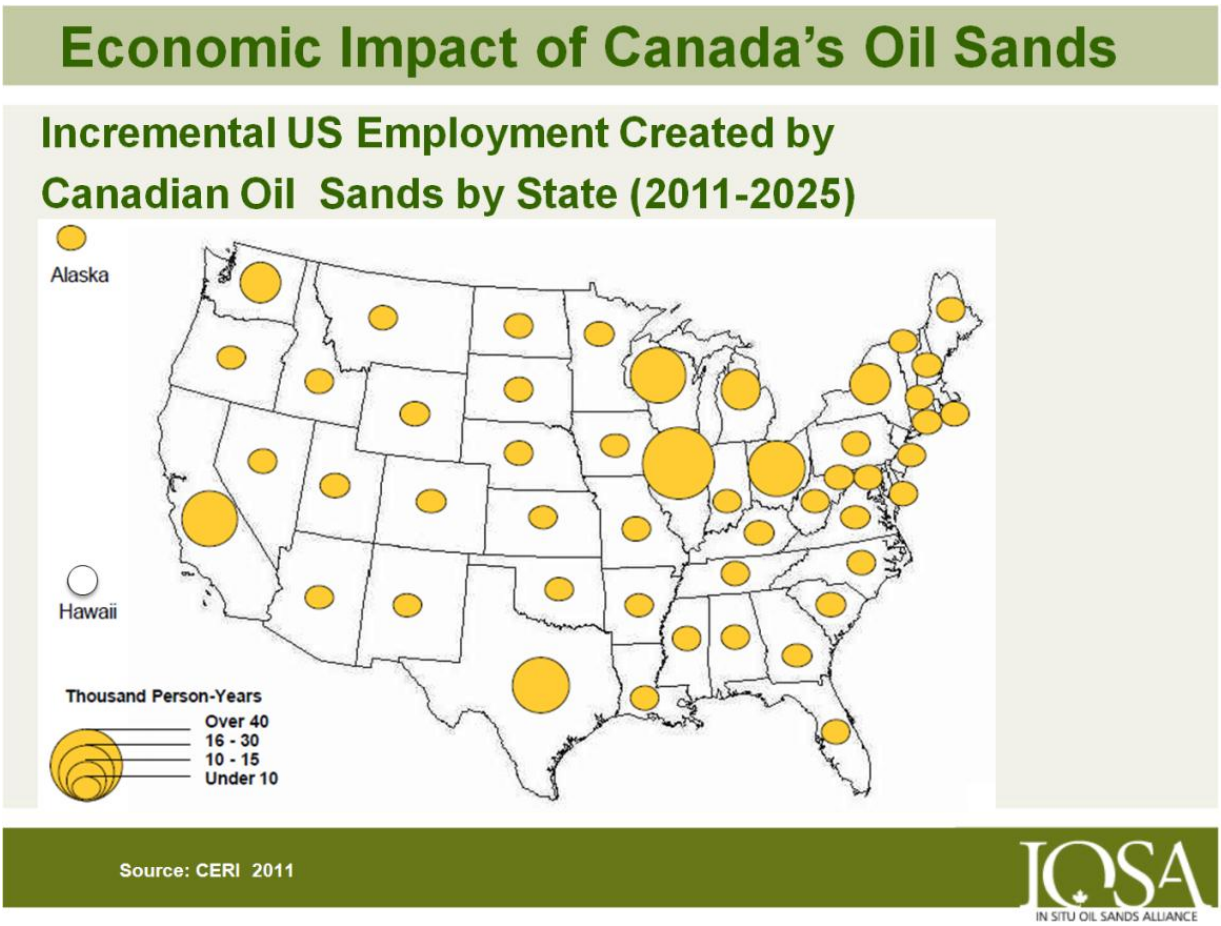
These technologies can also support more efficient life-cycle fuel use. For example, these barrels could be tailored to be an ideal feedstock in the creation of ultra-low sulfur diesel – a friendlier fuel option that many U.S. auto makers are now targeting.

Governments can have a role in encouraging technology acceleration. SAGD itself was pioneered by a public-private research partnership: the Alberta Oil Sands Technology and Research Authority, or

AOSTRA. AOSTRA pioneered the technology, but it took the collaboration of industry expertise and capital to develop it to commercial success. Similar efforts, such as "Alberta Innovates" represented today by Dr. Issac, continue to play an important role in the next generation of innovation. Industry, academia and governments – including governments on both sides of our shared border – all have a role in driving technology.

Governments also have a necessary and critical role as regulators. Good regulation must ensure protection of the public interest, without being too burdensome or arbitrary as to hinder economic growth and damage the public interest. We need to streamline regulatory processes, while still maintaining the highest standards. Regulation must be comprehensive – but it must also be efficient so that windows of opportunity to invest and innovate are not missed.

To conclude, innovation, collaboration and regulatory efficiency are all critical to our economy today and in the future. Looking at the oil sands industry alone, the prize for the United States is seeing an increase in goods and services output projected to reach $45 billion per year by 2035 and the creation of nearly half a million American jobs in that same time frame.



Canada and the United States have a tremendous history working together across our borders to our mutual benefit. This has particularly been the case with energy and today I would argue that our mutual interest in economic stability, environmental responsibility and energy security is stronger than ever. The focus of this committee on harnessing technology to realize those goals is entirely appropriate and I thank you for your time today.

This document refers to two substantial volumes of research which can be accessed at the following links:
Jacobs Consultancy Canada Wells-to-Wheels http://www.ai-ees.ca/home/initiatives/projects/lca

Canadian Energy Research Institute: The Impacts of Canadian Oil Sands Development on the United States' Economy http://www.scribd.com/doc/21296235/CERI-The-Impacts-of-Canadian-Oil-Sands-Development-on-the-United-States%E2%80%99-Economy